ARDEC
PRODUCTION SYSTEM

Strategic Business Plan Annex

Exceptional Production Support

21 Mar 97

Production System Plan - Table of Contents

I. Overall System Strategy

1. Production System Customers:

The primary customers of the Production System are the Industrial Operations Command (IOC) and the Armament, Chemical, Acquisition and Logistics Activity (ACALA) both located at Rock Island Arsenal. An additional customer is embodied in the operational Army which is the ultimate recipient and user of most of the products which are supported by the Production System. Additional efforts are required to interface with the User as embodied in the Training and Doctrine Command (TRADOC). The support or lack thereof for the items we support during production impact how we are judged by our OSD and, particularly, DA customers. Additional efforts are required to interface with the User as embodied in the Naval Ordnance Center, Naval Explosive Ordnance Disposal Technology Division, Indian Head, MD, and Forces Command, 52nd Ordnance Group (EOD), Fort Gillem, GA..

2. TACOM-ARDEC Business Areas:

Our business areas represent an irreducible list of areas in which TACOM-ARDEC must maintain technical competence in order to fulfill its current set of assigned missions. Figure 1 is a current list of the business areas. TACOM-ARDEC personnel working within the Production System must be proficient in one or more of the TACOM-ARDEC Business Areas in order to provide effective production support for TACOM-ARDEC materiel.

TACOM-ARDEC Business Areas
Mine and Demolitions
Smart Munitions
Direct Fire
Indirect Fire
Fire Control
Gun Propulsion
Fuzing and Lethal Mechanisms
Insensitive Munitions
Soldier Weapons
Pollution Prevention R&D

Figure 1.

3. Overall Production System Strategy and Drivers:

The overarching strategy for the Production System is to provide technical data and production engineering support which results in the production of safe and reliable hardware at the absolute minimum cost and in the shortest time. There are several factors within the Army which are strategy drivers and they are listed in figure 2.

Production Support System Strategy Drivers
Reduced Production Requirements
Acquisition Reform
Move to Performance Specifications
Environmental Concerns during Production
Diminishing Manufacturing Supplier Base
Change in the Customer Environment

Figure 2.

4. Links to Other TACOM-ARDEC Activities:

The Production System is linked to other TACOM-ARDEC systems primarily through the lifecycle concept (See Figure 3).

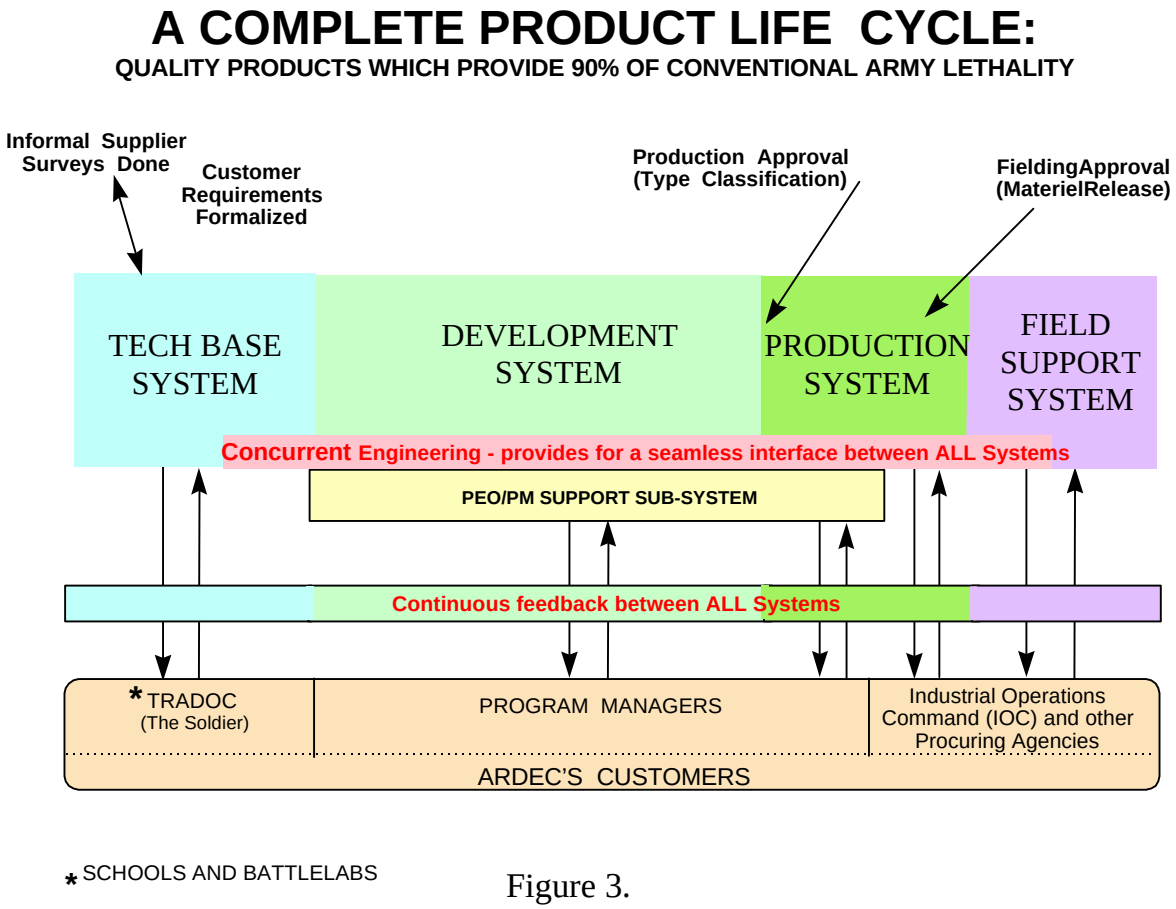

Figure 3.

The products of the Development System feed the Production System. The products of the Production System, in turn, feed the Field Support System. The adequacy of this linkage is measured in terms of successful materiel release actions. The Production System utilizes feedback from the Field Support System to improve its processes. The Production System is also linked to the systems within the TACOM-ARDEC Support Systems as we depend on various aspects of these systems to accomplish our efforts.

II. Metrics Summary

(The summary of metrics below is detailed in Section III: Metrics. This summary does not include process level metrics, future SMR metrics or metrics tracked by process owners outside of the Production System which impact the system)

TACOM-ARDEC-Level Macro-metrics

The percent of materiel release actions processed without conditions.

Systems Measurement Review Metrics

1. **The percent of materiel release actions processed without conditions.**
2. **Number of RFD/RFWs (per procurement action) received each year compared to previous years**
3. **Percent of TDPs returned for tech data reasons**
4. **Percent of materiel releases approved on-time with respect to the original forecast**
5. **Average processing time for secondary item TDPs**
6. **Average processing time for waivers and deviations**
7. **Value engineering savings**
8. **Percent of Engineering Study Proposals (ESPs) on schedule from original milestones**

III. System Strategies & Metrics to Support TACOM-ARDEC Goals

The following paragraphs relate the TACOM-ARDEC Goals to the specific System Strategies and Metrics of the Production System. For each System Strategy there is at least one metric. Metrics are continually evaluated and are added and deleted at the discretion of the process owners.

1. **TACOM-ARDEC Goal**: Be a "Center of Excellence" in armaments providing customers with “best value” products and services.

   - **System Strategy**: There are three aspects of the Production System Strategy which support the first TACOM-ARDEC Goal:

     A. To Materiel Release (obtain fielding approval) for all systems which meet or exceed all customer requirements. The ultimate customer acceptance of TACOM-ARDEC developed and produced materiel occurs after full Materiel Release.

     B. To improve production support processes and products to provide “best value” and maximize customer satisfaction. By providing mature, state-of-the-art technical data packages for procurement of our items, TACOM-ARDEC reduces the need for waivers/deviations associated with our technical data packages (TDPs); The result is better quality products produced at a reduced cost (i.e., best value products).

     C. To build and maintain a world-class supplier base. TACOM-ARDEC will partner with its suppliers to help improve the quality of their products and processes.

   - **Metric Goal 1A**: Maximize full releases of systems where TACOM-ARDEC provides the primary technical and engineering support. The output is the number of new systems released to the soldier in the field. The impact will be product dependent and will be captured in the product metrics provided in the Development System Strategic Plan. *[GPRA & SMR metric; Materiel Release Process Owner]*

     - **Rationale for Metric**:

       - **Usefulness:** The percent of materiel release actions processed without conditions are plotted over time (FY). All materiel release types (full, conditional, training) count toward the total number of release actions. Only the initial conditional release of a system is counted as a release with conditions. Subsequent conditional releases of the same system are treated as follow-ons to the initial release. Emergency release actions are not counted toward the total number releases or as a release with conditions. The use of Interim Contractor Support that was planned as part of the Acquisition Strategy is not counted as a conditional release.

         An initial release with conditions indicates that a customer requirement was not satisfied prior to fielding, while a full release indicates that all customer requirements were either met or exceeded. Follow-on conditional releases are an extension of the original conditional release action. Emergency releases are quick response actions used in times of national emergency to meet an urgent need for use in combat. Emergency releases are generally developmental items or items in the early phases of production. This is a product quality and customer satisfaction metric.

       - **Expected Result**: Expect this metric to increase and/or be maintained at a high level.

- **Desired Outcome**: TACOM-ARDEC will provide materiel to the field that meets or exceeds user requirements.

- **Metric Targets**:

	Current	1 Year	5 Year	Longterm
% of materiel releases	100	100	100	100 without conditions

- **Metric Goal 1.B**: Minimize requests for waivers and deviations from producers utilizing TACOM-ARDEC technical data packages. *[SMR metric; ESIP Process Owner]*

  - **Rationale for Metric**:

    - **Usefulness of Metric:** Each RFD/RFW is logged into a permanent, computerized database upon its receipt. The number of RFD/RFWs received this year in relation to the number of procurement actions can be compared against the number received in previous years. The metric is a direct, quantifiable reflection of the maturity of our TDPs.

    - **Expected Result**: The metric should decrease or be maintained at its current low level, reflecting the maturity of our TDPs.

    - **Desired Outcome**: Closer adherence to our technical requirements by our contractors, and less difficulty in acquiring items that are the best value for the dollar.

  - **Metric Targets**:

	Current	1 Year	5 Year	Longterm
Number of RFWs/RFDs	0.2:1	0.2:1	0.18:1	0.15:1

- **Metric Goal 1.C**: Minimize the number of technical data errors in TACOM-ARDEC technical data packages. This is a product quality metric. *[SMR metric; Tech Data Process Owner]*

  - **Rationale for Metric**:

    - **Usefulness of Metric:** Tracking the TDP error rate can validate the quality of the TDP.

    - **Expected Result**: This metric should decrease, reflecting more mature TDPs. As the problems are identified and the process improved the problems should not reoccur.

    - **Desired Outcome**: Minimize errors in TDPs associated with technical data management to provide error-free TDPs.

  - **Metric Targets**:

	Current	1 Year	5 Year	Longterm
Tech data error rate (%)	2.0	1.5	1.0	1.0

- **Metric Goal 1.D**: Maximize the percentage of contract dollars with contractors in the Contractor Performance Certification Program (CP)2 *[SMR metric; Supplier Quality Process Owner]*

  - **Rationale for Metrics**:

    - **Usefulness of Metrics:** The (CP)2 program provides a framework for becoming a world-class supplier. The percentage of contract dollars going to (CP)2 contractors indicates the extent to which TACOM-ARDEC is involved with world-class contractors.

    - **Expected Result**: This percentage should increase over time.

    - **Desired Outcome**: A world-class supplier base certified against the (CP)2 criteria.

  - **Metric Targets**:

	Current	1 Year	5 Year	Longterm
% of TACOM-ARDEC Acquisition Center contract dollars with (CP)2 contractor	20	30	75	100

- **Metric Goal 1.E**: Maximize the composite supplier quality index for TACOM-ARDEC suppliers. *[SMR metric; Supplier Quality Process Owner].*

  - **Rationale for Metrics**:

    - **Usefulness of Metrics:** The composite supplier quality index is made up of various supplier quality indicators such as first article test yields, quality deficiency reports and requests for waivers and deviations submitted by TACOM-ARDEC contractors. This index provides an indication of how the entire TACOM-ARDEC supplier base is performing.

    - **Expected Result**: This percentage should increase over time.

    - **Desired Outcome**: A world-class supplier providing consistently exceptional products.

  - **Metric Targets**:

	Current	1 Year	5 Year	Longterm
Composite supplier quality index	New	TBD	TBD	TBD

- **Metric Goal 1.F**: Maximize percentage of Engineering Study Proposals (ESPs) on schedule from original milestones. *[SMR metric; ESIP Process Owner]*

  - **Rationale for Metrics**:

    - **Usefulness of Metrics:** The purpose of engineering studies is to develop improvements in performance or cost savings associated with production items. Completing

engineering study proposals on schedule will result in implementation of the improvement into production hardware in a timely fashion, thereby giving our soldiers a better product quicker, better and less expensive.

- **Expected Result**: The metric percentage should increase over time.

- **Desired Outcome**: TACOM/ARDEC will provide improved products to the field at the earliest possible date.

- **Metric Targets**:

	Current	1 Year	5 Year	Longterm
% of ESPs completed on Schedule	21	50	90	100

2. **TACOM-ARDEC Goal**: Be an organization that is capable of quickly meeting unique and changing customer needs.

- **System Strategy**: There are three aspects of the Production System Strategy which support the second TACOM-ARDEC Goal:

A. Assure a high degree of production support responsiveness.

B. Foster the use of performance specifications, commercial processes and commercial specifications.

C. Work with the IOC and TACOM-ACALA to determine appropriate items for conversion to performance specifications.

- **Metric Goal 2.A**: Maximize on-time Materiel Releases with respect to the original TACOM-ARDEC forecast (The percent of materiel releases that are approved on-time with respect to the original TACOM-ARDEC forecast are plotted over time). *[SMR metric; Materiel Release Process Owner]*

  - **Rationale for Metric**:

    - **Usefulness of Metric:** Providing materiel to our customer on-time in a changing environment is key to achieving customer satisfaction. The original forecast must closely represent our fielding commitment to the user.

    - **Expected Result**: Expect this metric to increase.

    - **Desired Outcome**: TACOM-ARDEC will provide materiel to the field that meets or exceeds user requirements on schedule. Pre-MRRBs will be utilized to identify and resolve issues early, and Pareto analysis will be utilized to improve the percentage of full releases.

  - **Metric Targets**:

	Current	1 Year	5 Year	Longterm
Percentage of on-time materiel releases	38	100	100	100

- **Metric Goal 2.B**: Maximize the percentage of military specifications and standards converted to performance specifications, commercial processes, commercial specifications and non-Government standards and the conversion of detail technical data packages to performance-based technical data package. [ESC level metric; Tech Data Process Owner]

  - **Rationale for Metric**:

    - **Usefulness of Metric:** The use of performance specifications, commercial processes and specifications and non-Government standards and is a DoD thrust. This metric will monitor how successful TACOM-ARDEC has been at adopting these practices.

    - **Expected Result**: The percentage should increase over time and near 100% for non-military unique items.

    - **Desired Outcome**: Greater flexibility and opportunity for competition within the TACOM-ARDEC supplier base and increased access to the state-of-the-art technology. In addition, this metric supports TACOM-ARDEC Goal #4 because utilizing these practices should also improve efficiency and reduce costs.

  - **Metric Targets**:

	Current	1 Year	5 Year	Longterm
% of TACOM-ARDEC military specifications and standards intended for conversion to performance specs, commercial processes and specs, non-Government stds complete	2	34	95	100
% of TACOM-ARDEC detail TDPs determined to be converted to performance-based TDPs completed	New	TBD	TBD	TBD

- **Metric Goal 2.C**: Maximize the percentage of the TACOM-ARDEC workforce and TACOM-ARDEC suppliers trained in acquisitions reform principles. *[SMR metric; Acquisition Requirements Process]*

  - **Rationale for Metric**:

    - **Usefulness of Metric:** Training is essential in order to foster a cultural shift toward acquisition reform principles. This metric will monitor how many people are becoming educated in the new philosophies.

    - **Expected Result**: This metric should increase until it nears 100%.

    - **Desired Outcome**: A cultural change occurring in the workforce and with our suppliers so that the use of acquisition reform principles becomes the norm instead of the exception.

- **Metric Targets**:

	Current	1 Year	5 Year	Longterm
% of the workforce trained in acquisition reform principles	30	40	90	100
% of the supplier base trained in acquisition reform principles	20	40	90	100

3.0 **TACOM-ARDEC Goal:** Strengthen our customer base within core-related business areas.

- **System Strategy**: There are two aspects of the Production System Strategy which support the third TACOM-ARDEC Goal:

  A. Expand in areas of "enhanced" funding (e.g., pollution prevention, elimination of hazardous materials, Operational Support Cost Reduction (OSCR) program).

  B. Work with non-traditional customers (e.g., Navy, Airforce, industry, academia and other Government Agencies) within core production support-related skill groups when they do not have enough Army work.

- **Metric Goal 3.A**: Maintain funding for production support-related skill groups. The Production Process Owners will broadly review funding status with the Production System Owner on a regular basis. *[ESC level metric; All Production System Process Owners]*

  - **Rationale for Metric**:

    - **Usefulness of Metric:** This metric focuses attention on the fact that unfunded production groups will not remain viable.

    - **Expected Result**: Process owners are expected to ensure that production groups are adequately funded.

    - **Desired Outcome**: Maintain production support skills as a TACOM-ARDEC core competency.

- **Metric Goal 3.B**: Maximize collaborative projects with non-traditional customers. *[ESC level metric; All Production System Process Owners]*

  - **Rationale for Metric**:

    - **Usefulness of Metric:** This metric also focuses attention on the fact that unfunded field support groups will not remain viable. It reminds process owners to look to non-traditional funding areas to maintain critical skill groups.

    - **Expected Result**: The metric will be considered in control if it is constant or increasing.

    - **Desired Outcome**: Maintain production support skills as a TACOM-ARDEC core competency.

4.0 **TACOM-ARDEC Goal:** Continuously improve efficient use of resources.

- **System Strategy**: Minimize the cost to produce weapon systems:

  A. Utilize acquisition reform legislation to the fullest extent possible (Supported by Metric Goal 2A and 2B).

  B. Encourage Value Engineering.

  C. Reduce cycle-time to update/validate technical data.

  D. Reduce cycle-time to process requests for waivers and deviations (RFDs & RFWs).

  E. Improve supplier base efficiency by evaluating and partnering to improve their product and process quality (Supported by Metric Goal 1D).

- **Metric Goal 4.A**: Maximize Value Engineering savings. The amount of creditable VE savings is determined by AMSTA-AR-RM after each VEP/VECP is approved by the Level I CCB. The sum of the creditable savings for the year can be compared against the savings from prior years. *[SMR metric tracked for all of TACOM-ARDEC; ESIP Process Owner]*

  - **Rationale for Metric**:

    - **Usefulness of Metric:** Increasing the amount of VE savings should reduce procurement costs of our items.

    - **Expected Result**: An increase in credited VE savings.

    - **Desired Outcome**: Reduced acquisition costs.

  - **Metric Targets**:

	Current	1 Year	5 Year	Longterm
Value Engineering Savings	$11.3 M	(Varies from year to year)		

- **Metric Goal 4.B**: Minimize technical data and RFD/RFW processing time. Each RFD/RFW is logged in and out through a permanent, computerized database which calculates individual and average processing times. *[SMR metric; ESIP & Tech Data Process Owners]*

  - **Rationale for Metrics**:

    - **Usefulness of Metrics:** Reducing these metrics should result in a "day-for-day" reduction in overall acquisition time. The average processing time this year can be compared against processing times from previous years.

    - **Expected Result**: These metrics should decrease, indicating a reduction in processing time.

    - **Desired Outcome**: A reduction in the time between contract award and delivery to the field.

- **Metric Targets**:

	Current	1 Year	5 Year	Longterm
Days to process RFWs/RFDs	28	27	26	25
Days to process TDPs	30	15	5	1

5.0 **TACOM-ARDEC Goal:** Foster teamwork and employee involvement.

- **System Strategy**: Production support will be provided utilizing integrated product teams (IPTs) whenever appropriate.

- **Metric Goal 5.A**: Maximize the number of chartered IPTs for systems in the production phase. The percentage of production projects with a chartered and trained IPT versus all production projects will be determined. *[The Concurrent Engineering Process Owner will track this metric].*

  - **Rationale for Metric**:

    - **Usefulness of Metric:** Use of CE enhances product quality and employees attitudes towards work. In addition, IPTs have been mandated by Mr. Perry.

    - **Expected Result**: The percentage of IPTs utilized within the production system is expected to increase over time.

    - **Desired Outcome**: The quality of ARDEC products will increase while the cost will go down as a result of using IPTs.

  - **Metric Targets**:

	Current	1 Year	5 Year	Longterm
% of Production System projects using IPTs	New	85%	100%	100%

6.0 **TACOM-ARDEC Goal:** Foster mutually beneficial relationships with our surrounding communities.

- **System Strategy**: Seek out opportunities to inform communities of TACOM-TACOM-ARDEC's role in National Security and to share our production-related knowledge and expertise. Opportunities include:

  (1) Invite community population to visit TACOM-ARDEC and learn what we do.

  (2) Participate in community activities (e.g., schools) to transfer technical and management skills.

  (3) Foster and support scientific, engineering and management programs.

Metrics- *[Metrics for this goal and objectives are incorporated into the TACOM-ARDEC metrics on Public Responsibility].*

7.0 **TACOM-ARDEC Goal:** Develop products that pose no incidental or accidental risk to public health, safety or the environment.

- **System Strategy**: Provide and/or revise/modernize/remove technical data and production engineering support which does not result in production of hardware which adversely affects public health, safety or the environment.

- **Metric Goal 7.A**: Materiel Release items which have no accidental risk to public health, safety or the environment (Attain full release of 100% of those systems where TACOM-ARDEC provides the primary technical and engineering support). *[SMR metric; Materiel Release Process Owner]*

  - **Rationale for Metric**:

    - **Usefulness of Metric:** Materiel which obtains a full release is certified as posing no incidental or accidental risk to public health, safety and the environment. The percent of Materiel Release Actions processed without conditions is plotted over time (FY). All materiel release types (full, conditional, training) count as the total number of release actions. Only the initial conditional release of a system is counted as a release with conditions. Subsequent conditional releases of the some system are treated as follow-ons to the initial release. Emergency release actions are not counted toward the total number releases or as a release with conditions.

    - **Expected Result**: Expect this metric to be maintained at a high level.

    - **Desired Outcome**: TACOM-ARDEC will provide materiel to the field, which poses incidental, or accidental risk to public health, safety and the environment.

  - **Metric Targets**:

	Current	1 Year	5 Year	Longterm
% of Materiel Releases without conditions	100	100	100	100

- **Metric Goal 7.B**: Minimize the percentage of TDPs with Ozone Depleting Substances (ODS). ("Green products and processes). *[ESC level metric; Tech Data Process Owner]*

  - **Rationale for Metric**:

    - **Usefulness of Metric:** This metric will monitor how successful TACOM-ARDEC has been at eliminating the use of ODSs from technical data packages.

    - **Expected Result**: The percentage should decrease over time and near 0%.

    - **Desired Outcome**: Total elimination of the use of ODSs during production.

  - **Metric Targets**:

	Current	1 Year	5 Year	Longterm
% of TDPs with environmentally unfriendly materials cited	20	15	5	0

IV. Quality and Improvement Strategies of System Processes

We continue to take an incremental approach to improving the processes within the Production System. Improvement is the result of teams focusing on customers and processes, managing with meaningful metrics, and working to eliminate non-value-added steps in their processes.

The Production System consists of multiple processes as depicted in Figure 4. During the past year, the Supplier Quality Process was added to the Production System in order to focus attention on improving TACOM-ARDEC's supplier base.

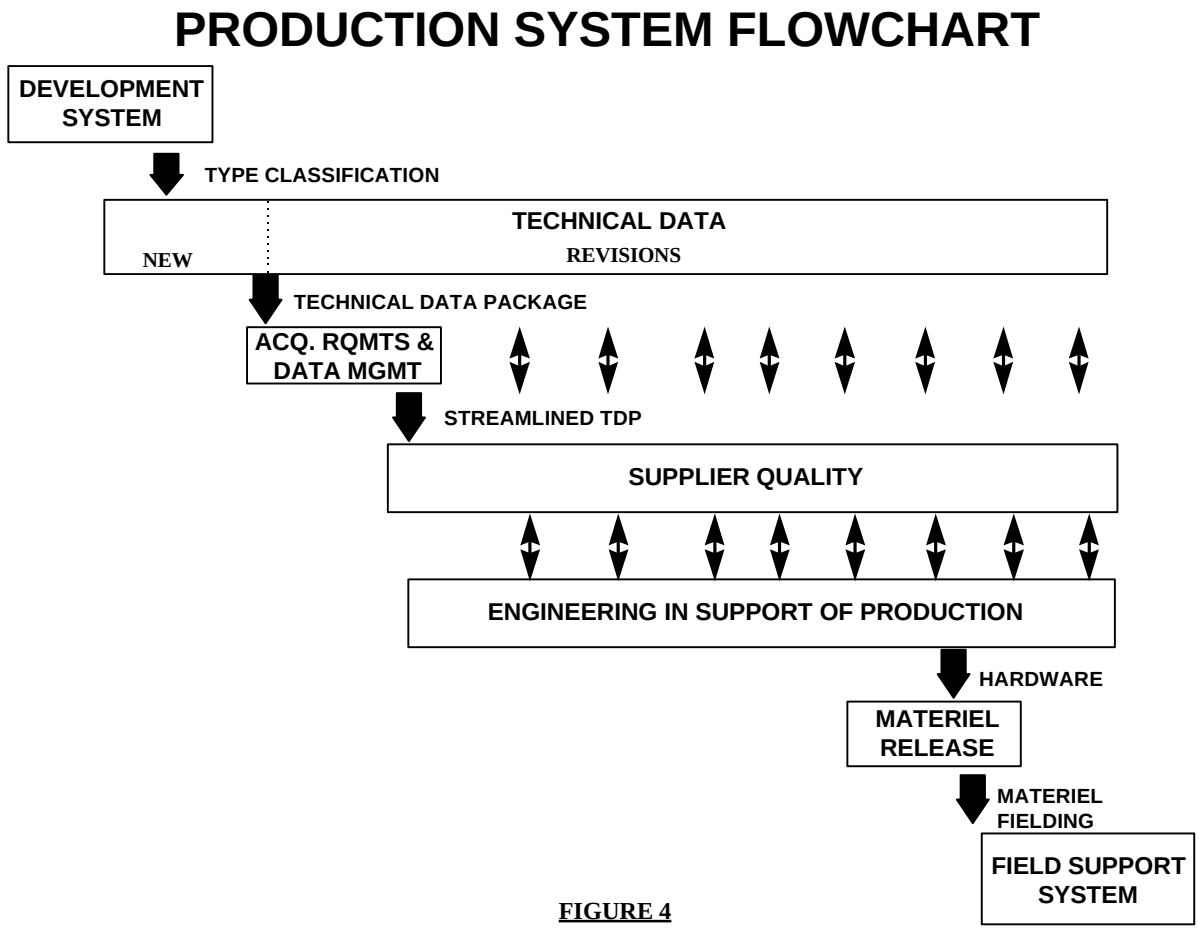

FIGURE 4

Each of these has an owner. They are all guided by the Production Executive Steering Committee (ESC). This ESC is composed of the TACOM-ARDEC Production System Owner as well as the process owners within the system. The ESC guides all activities of the system.